

Table of contents

	Page
Overview	2

Specification/ application	3

NB 4000	4

Options/ Accessories	6

Dimensions/ materials	7

Spare parts	9

Electrical installation	11

Subject to change.

All dimensions in mm (inches).

All prices in Euro (€) or USD (\$),
 excluding VAT.

All EURO prices are EXW Betzigau,
 all USD prices are EXW Memphis,
 excluding packaging costs.

Valid: From 01.04.2019 until 31.03.2020, unless otherwise agreed.

By publishing this selection list all other lists become invalid.

We assume no liability for typing errors.

Different variations to those specified are possible.
 Please contact our technical consultants.

Overview

Features

Continuous level measurement of solids applications

Process

- Independent of bulk material properties
- Accurate measurement

Service

- Simple installation and commissioning
- Rope and tape version with long service life
- Low maintenance

Approvals

- Approval for use in Hazardous Areas
- 2011/65/EU RoHS conform

Mechanics

- Measurement range up to 30 m (100 ft)
- 1½" process connection possible
- Aiming flange to be mounted directly on a flat silo roof
- Internal tape cleaner for difficult materials

Electronics

- Micro processor controlled measurement
- Diagnostic possibilities
- Output 4-20 mA/ Modbus
- Two programmable Relay
 (can be used as Counting/ reset pulse output
 or as Failure/ Upper stop position)



NB 4100
 Rope version
 Fig. with flange DN100
 and PVC sensor weight



NB 4200
 Tape version
 Fig. with thread connection
 and stainless steel sensor
 weight



NB 4100
 Rope version
 Fig. with aiming flange and
 stainless steel sensor weight
 with pin

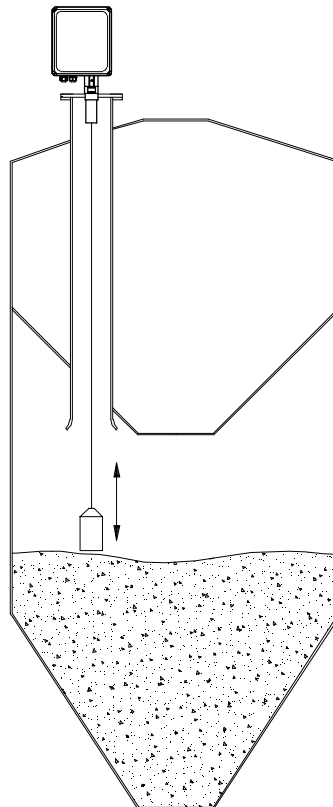
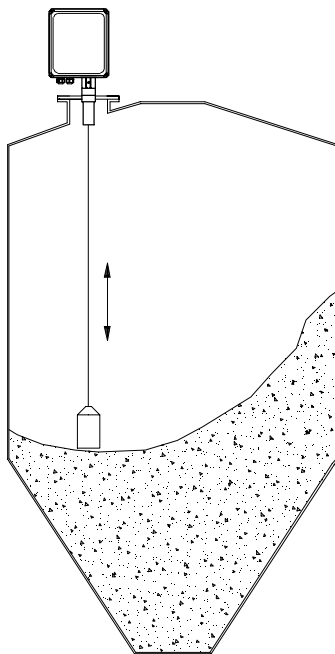
Specification / application

Specification

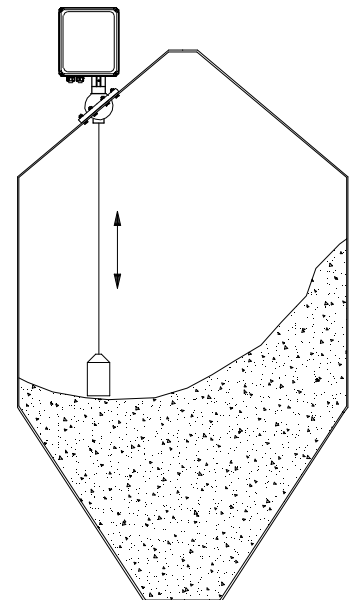
Process	Measurement range	15 m (50 ft) or 30 m (100 ft)
	Process temperature	80°C (176°F)
	Process overpressure	-0.2 .. +0.2 bar (-3.0 .. + 3.0 psi)
	Min. powder density	>300 g/l (18 lb/ft³)
Electronics	Power supply	AC version 115 V or 230 V 50 - 60 Hz DC version 20 .. 28 V
	Output	4-20 mA
		2 relais (optional)
		Modbus RTU
Approvals	Dust Ex	ATEX 1/2D FM Cl. II, III Div. 1, TR-CU
	Ordinary Location	CE, FM, TR-CU

Application

Solids measurement



Aiming flange
screwed directly
to the silo roof



For measurements through a long pipe
in a double chamber silo we recommend
the use of NB 4200 (tape version).

NB 4000

NB 4100

Rope version
(fig. with flange DN100
and PVC sensor weight)



NB 4200

Tape version
(fig. with thread connection
and stainless steel sensor
weight)



Cable entries (by default)

Depending on selected version (options see pos.26):

CE, ATEX,	Screwed cable gland: 1x M25 x 1.5 and 1x M20 x 1.5
TR-CU	Blindplug: 1x M25 x 1.5 and 1x M20 x 1.5

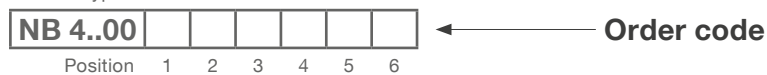
FM	Open conduit ANSI B1.20.1: 1x NPT 3/4" and 1x NPT 1/2"
	Blindplug: 1x NPT 3/4" and 1x NPT 1/2"

Dimensions see page 7

NB 4000

pos.1	Basic type						
	C	NB 4100	Rope version	.....			•
	D	NB 4200	Tape version	.....			•
pos.2	Certificate						
	0	CE ⁽¹⁾				•
	W	ATEX II 1/2 D	.....				•
	M	FM general purpose	.....				•
	N	FM Class II, III Div.1 Group E-G	.....				•
	E	TR-CU Ex ta/tb IIIC T! Da/Db X	.....				•
pos.3	Measurement range						
	1	15 m (50 ft)	.....				•
	2	30 m (100 ft)	.....				•
pos.4	Power supply/ Signal output						
	1	230 V 50 - 60Hz	4-20 mA	.....			•
	4	230 V 50 - 60Hz	Modbus	.....			•
	2	115 V 50 - 60Hz	4-20 mA	.....			•
	5	115 V 50 - 60Hz	Modbus	.....			•
	3	20 .. 28 V DC	4-20 mA	.....			•
pos.5	Process connection						
	A	Thread R 1½"	tapered EN 10226-1	.....			•
	B	Thread NPT 1½"	tapered ANSI B1.20.1	.....			•
	X	Flange DN100 PN16 (EN 1092-1) and flange 4" 150lbs ANSI B16.5 (unit is fitting to this flange)	.....				•
	Y	Flange 2" and flange 3" 150lbs ANSI B16.5 (unit is fitting to this flange)	.....				•
	W	Aiming flange (to be mounted directly to the silo roof) ⁽⁵⁾				•
pos.6	Sensor weight ⁽²⁾						
	Y	without ⁽³⁾				•
	A	PVC ⁽⁴⁾				•
	C	Stainless steel	.....				•
	E	Folding cover	.....				•

Basic type



All positions are available in special design (use code "Z").

⁽¹⁾ TR-CU (Ordinary Locations) included

⁽²⁾ For use in Hazardous Locations (Dust Ex): It must be ensured, that no static discharge from the material surface can occur. Sensor weights, which can be used in case of possible static discharge, on request.

⁽³⁾ Only for tape version. Including mounting set for sensor weight (see page 9: Sensor weights).

⁽⁴⁾ Does not fit through a 1½" nozzle, must be mounted after fixing the unit to the silo.

⁽⁵⁾ Mounting without a socket. Including fixing material (screws, sealing etc.).

Options / Accessories

Options

pos.11	x	Guarantee extension to 5 years	•
		Wear and tear parts rope/ tape and motor not included	
pos.21		Weather protection cover	•
		For Ex only approved for Zone 22 or Division 2	
pos.22		Internal heater	•
		Needed for: ambient temp. < -20°C (-4°F) or condense water inside silo or wet process atmosphere (Note: < -20°C (-4°F) with ATEX, FM Class II or TR-CU on request possible)	
pos.23		Length of socket pipe	
	1	200 mm (7.87")	•
	2	500 mm (19.7")	•
	3	1,000 mm (39.4")	•
pos.24		Pin for sensor weight	•
		POM or stainless steel (in accordance to selected sensor weight material, not for pos.6 E)	
pos.25		Relais output	•
		Two relais (possible indication; Failure, reset pulse, counting pulse, upper stop position) Nicht für Modbus (pos.4 4,5)	
pos.26		Cable entry	
		Selection of the following options only necessary, if a deviation from the default cable gland/ conduit is required:	
	0	Screwed cable gland 1x M25 x 1.5 + 1x M20 x 1.5 + blindplug 1x M25 x 1.5 + 1x M20 x 1.5	•
	A	Conduit 1x NPT ¾" + 1x NPT ½" + blindplug 1x NPT ¾" + 1x NPT ½"	•
pos.27		Preset fieldbus address (Modbus)	•
		Enables easy commissioning with Nivotec Level Monitoring System.	•
		Preset from address = "1" to "amount of ordered units". Address label on enclosure.	•
		Termination resistor set on unit with highest address. Other addresses possible on request.	•

Accessories

Minimum order value for spare parts or accessories is 75 €.

Fixing material for mounting the unit on a flange

zu107000	4 bolts M16 x 60, 8 washers, 4 nuts. Stainless steel.	•
----------	--	---

Sealings for mounting the unit on a flange

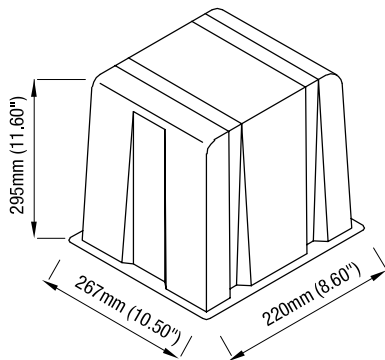
di300125	Flange sealing for DN100 PN16/ 4" (neoprene)	•
di300127	Flange sealing for 2" 3" 150lbs (neoprene)	•

Adapter NPT 1½" to NPT 3"

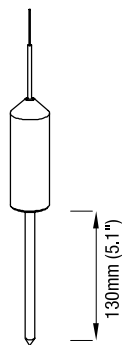
zu103100	Thread tapered ANSI B1.20.1, aluminium	•
----------	--	---

Cable gland

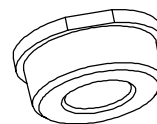
em400589	Cable gland with 2 inputs. M25 x 1.5, clamping range 2x ø4.5-7 mm, -20 .. +70°C	•
em400573	Cable gland, M20 x 1.5, clamping range ø6-12 mm, -40 .. +70°C.	•



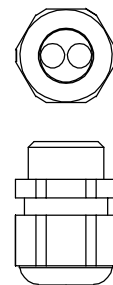
Weather protection cover



Pin for sensor weight
 POM or 1.4305 (303)



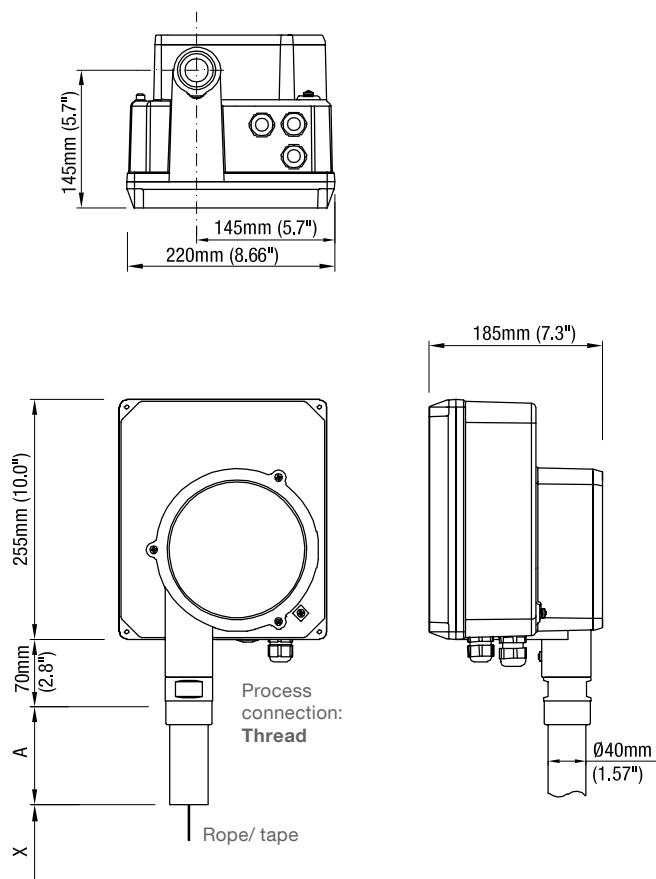
Adapter NPT 1½" to NPT 3"



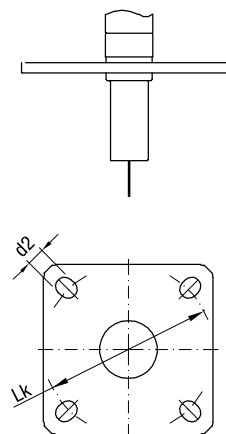
Cable gland with 2 inputs

Dimensions and materials

Basic unit

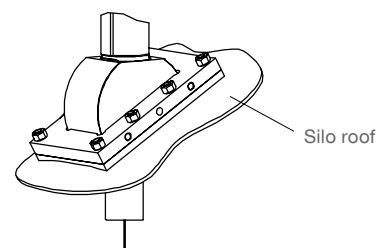


Process connection: **Flange**



Process connection: **Aiming flange**

To be screwed directly to the silo roof
 0° - 50° adjustable
 Including screws, nuts and sealing



Flange plate outside dimensions:
 Width x Height: 120 mm x 180 mm (4.7" x 7.1")

Dimensions

X = Length to bottom of sensor weight (in upper stop position, see next page)	
A = Length of socket pipe 100 mm (3.9") Optional 200 mm (7.9")/ 500 mm (19.7")/ 1,000 mm (39.4")	
Flanges	
fitting to: DN100 PN16/ 4" 150lbs	Lk = ϕ 180 - 190.5 mm (ϕ 7.1 - 7.5") slot d2 = ϕ 19 mm (ϕ 0.75")
fitting to: 2"/ 3" 150lbs	Lk = ϕ 120.7 - 152.4 mm (ϕ 4.75 - 6.0") slot d2 = ϕ 19 mm (ϕ 0.75")
Rope	ϕ 1.0 mm (ϕ 0.04")
Tape	12 x 0.2 mm (0.47 x 0.008")

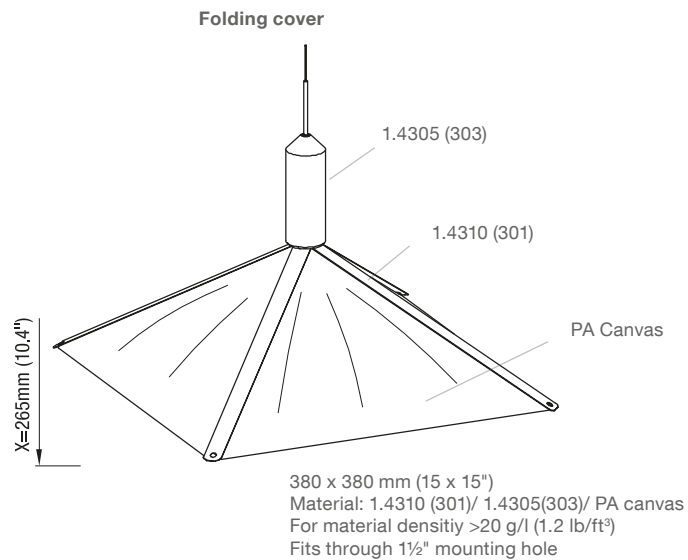
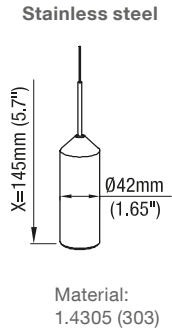
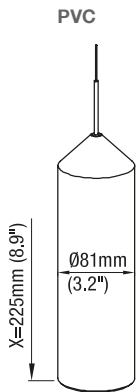
Materials

Housing outside	Aluminium, powder coated
Housing inside	Aluminium
Thread/ flange	Aluminium
Aiming flange	Aluminium/ 1.4301 (301)
Rope	1.4401 (316)
Tape	1.4310 (301)

Dimensions and materials

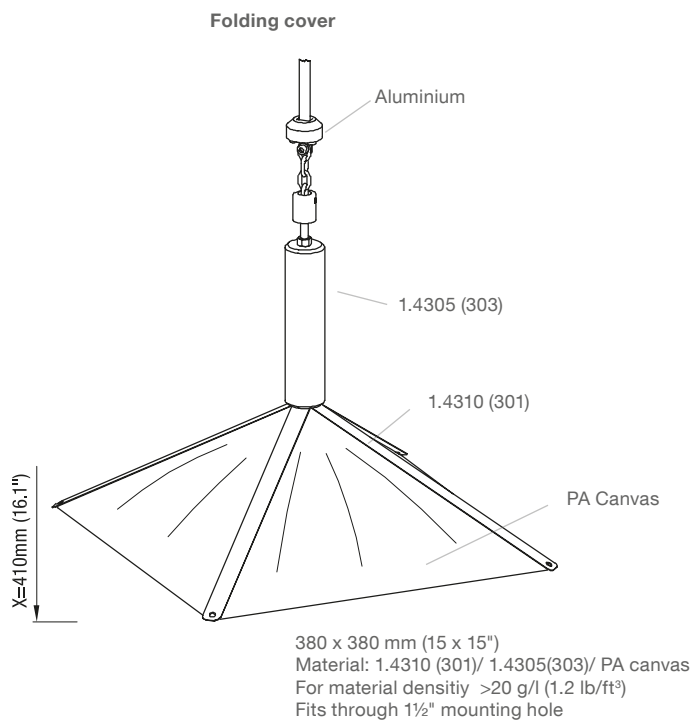
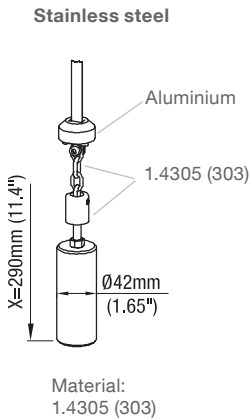
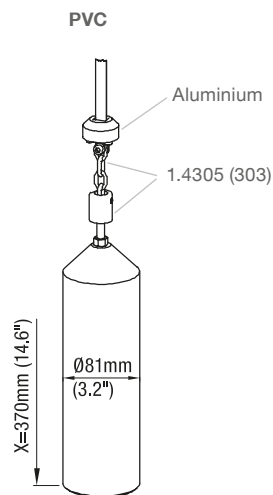
Sensor weights

Rope version



All sensor weights:
1,6 kg (3.5 lbs)

Tape version



Fixing elements between tape and sensor
weight: aluminium/ 1.4305 (303)

All sensor weights:
1.6 kg (3.5 lbs)

Spare parts

Minimum order value for spare parts or accessories is 75 €.

Roller

sl103239	Rope roller with 15 m rope	•
sl103240	Rope roller with 30 m rope	•
sb103239	Tape roller with 15 m tape	•
sb103240	Tape roller with 30 m tape	•

Sensor weights

All sensor weights are delivered incl. mounting parts for proper fixing to the rope/ tape and excl. rope/ tape

For rope version:

sl103231	PVC without pin	•
sl103232	PVC with pin	•
sl103233	Stainless steel without pin	•
sl103234	Stainless steel with pin	•
sl103235	Folding cover	•

For tape version:

sb103231	PVC without pin	•
sb103232	PVC with pin	•
sb103233	Stainless steel without pin	•
sb103234	Stainless steel with pin	•
sb103235	Folding cover	•

Mounting set without sensor weight

sl100280	For rope version	•
zu108030	For tape version	•

Motor

gm103202	Motor	•
-----------------	-------------	---

Electronics

pl103690	230 V 50 - 60 Hz	4-20 mA	without 2 Relais ⁽¹⁾	•
pl103691	230 V 50 - 60 Hz	4-20 mA	with 2 Relais ⁽¹⁾	•
pl103696	230 V 50 - 60 Hz	Modbus	without 2 Relais ⁽¹⁾	•
pl103692	115 V 50 - 60 Hz	4-20 mA	without 2 Relais ⁽¹⁾	•
pl103693	115 V 50 - 60 Hz	4-20 mA	with 2 Relais ⁽¹⁾	•
pl103697	115 V 50 - 60 Hz	Modbus	without 2 Relais ⁽¹⁾	•
pl103694	20 .. 28 V DC	4-20 mA	without 2 Relais ⁽¹⁾	•
pl103695	20 .. 28 V DC	4-20 mA	with 2 Relais ⁽¹⁾	•

Required information: Rope or Tape version; measuring range 15 m or 30 m; evt. further menue presettings.

Internal Heater ⁽²⁾

em100373	680 Ohms	For power supply 230 V 50 - 60 Hz	•
em100374	220 Ohms	For power supply 115 V 50 - 60 Hz	•
em100375	8.2 Ohms	For power supply 20 .. 28 V DC	•

Weather protection cover

zu400217	•
-----------------	-------	---

⁽¹⁾ Implements the electronic components needed to control the Internal Heater (needed for option pos.22)

⁽²⁾ Used for replacement for already mounted heater.

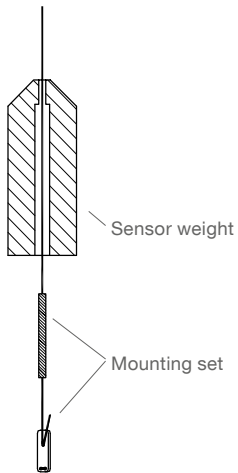
In case of re-fitting the Internal Heater, the electronics must include components for the Internal Heater Control (please contact factory).

Spare parts

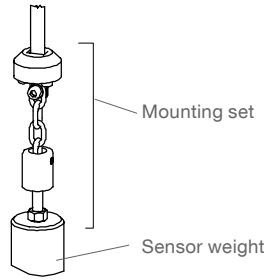
Sensor weights/ Mounting set

All sensor weights are delivered including stated parts for proper fixing to the rope/ tape

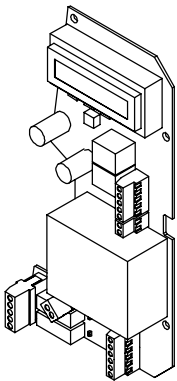
Rope version



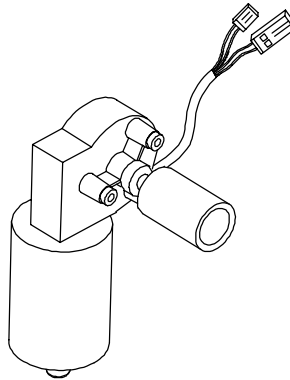
Tape version



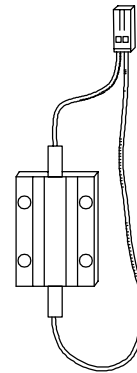
Electronics



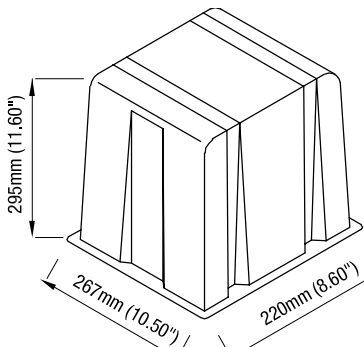
Motor



Internal heater



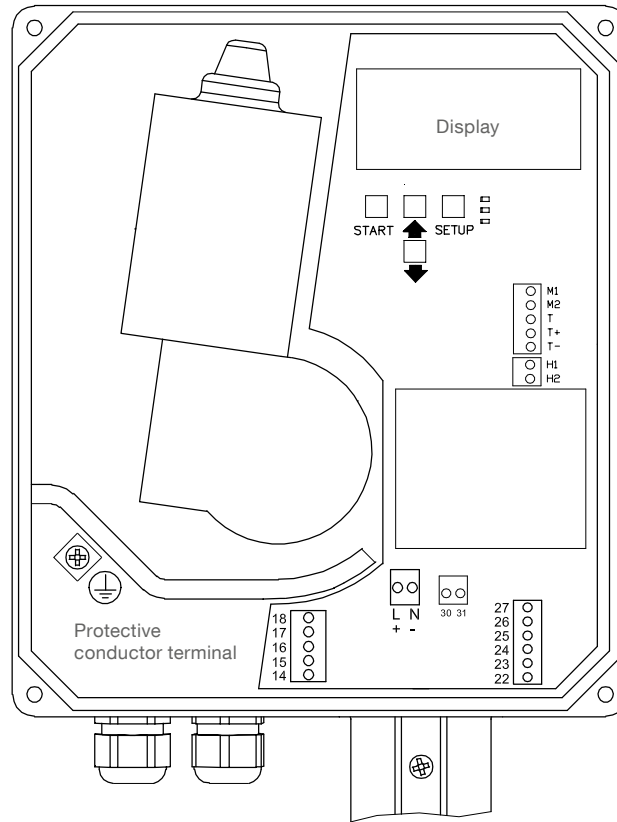
Weather protection cover



Electrical installation

Version 4-20 mA

Terminal location



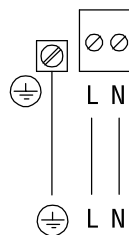
Internal terminals for motor and heater

- Terminals for:
- Power supply
 - Signal input:
 - Start of measurement
 - Measurement interruption
 - Signal output:
 - 4-20 mA
 - Relais

Note: Terminal 30 and 31 not used

Power supply

AC version

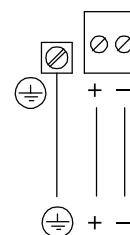


0.75 .. 2.5 mm²
(AWG 18 .. 13)

AC or DC supply depending on ordered version

230 V or 115 V 50 - 60 Hz

DC version



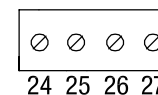
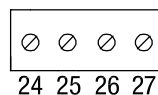
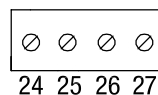
1.5 .. 2.5 mm²
(AWG 15 .. 13)

20 .. 28 V DC

Signal input:

Start of measurement

Measurement interruption



0.14 .. 2.5 mm²
(AWG 26 .. 14)

Start contact

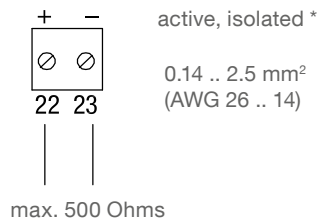
Start +24 V

alternative

Measurement interruption in case of filling. If used, remove factory provided connection.

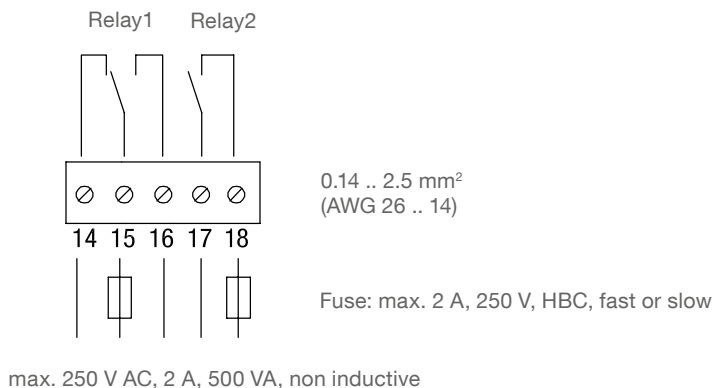
Electrical installation

Signal output:
 4-20 mA



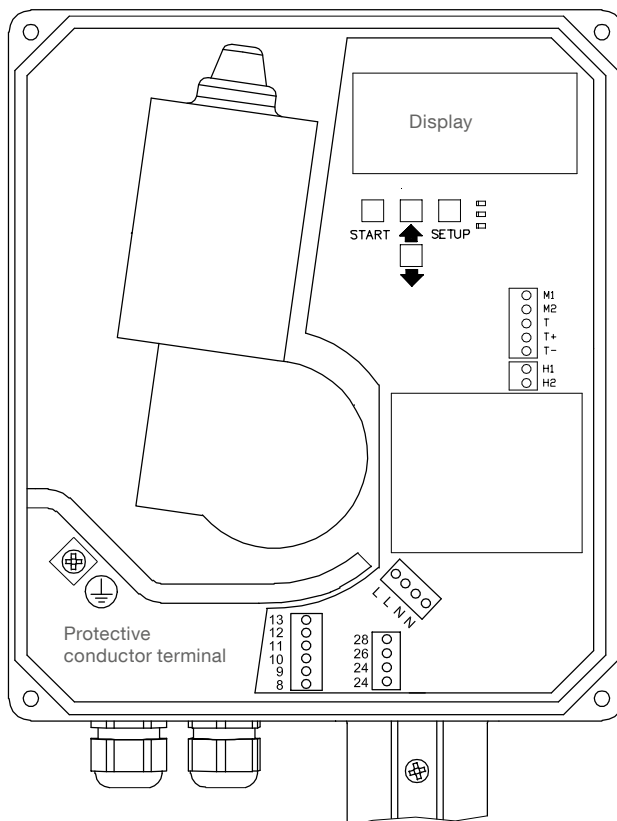
*** CAUTION:**
 If connecting to a PLC with isolated (floating) 4-20 mA input, the "-" line must be connected to ground of the PLC. See user manual of the PLC.

Signal output:
Relais
 (optional)



Version Modbus

Terminal location

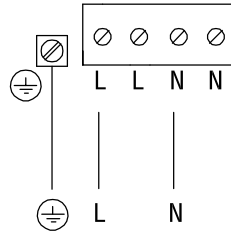


Internal terminals for motor and heater

- Terminals for:
- Power supply
 - Signal input: Measurement interruption
 - Signal output: Modbus

Electrical installation

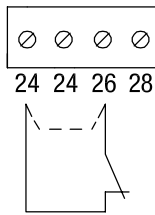
Power supply



0.75 .. 2.5 mm²
 (AWG 18 .. 13)

230 V or 115 V 50 - 60 Hz

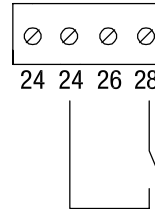
Signal input: Measurement inter- ruption



0.14 .. 2.5 mm²
 (AWG 26 .. 14)

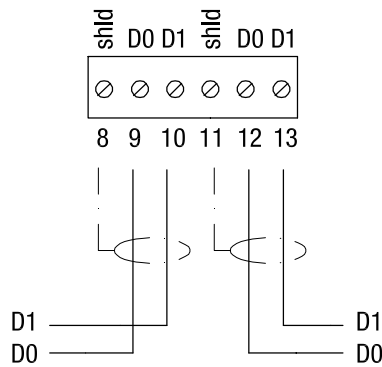
Measurement interruption in case of filling. If used, remove factory provided connection.

Signal input: Full detector

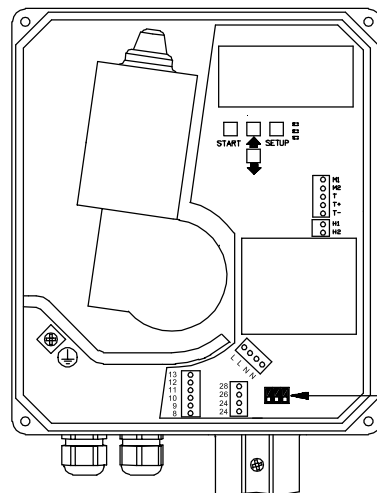


0.14 .. 2.5 mm²
 (AWG 26 .. 14)

Modbus network



Wiring according to Modbus standards



Setting Biasing and Termination Resistor

For use of NB 4000 units in a external Modbus network, it is possible to set Biasing and Termination Resistor on each unit as required.

Biasing	OFF*	OFF	ON	ON
Termination Resistor	OFF*	ON	OFF	ON



*factory provided

DIP Switch position:

Top view Side view